Landscapes as Industrial Artifacts: Lessons from Environmental History

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As industrial archeologists, we contend that material evidence is an important adjunct to the documentary record of the past. In this article, I will suggest ways we can enhance our analysis of a particular kind of artifact, the industrial landscape, to strengthen our claim that we have important contributions to make to the broader scholarly community. We can enhance our analysis of industrial landscapes, and indeed of all artifacts, by drawing on the insights and methods of environmental history.

Environmental history is an increasingly important subfield of history, gaining in importance as young scholars, who have grown up within the context of the environmental movement, mature and seek to engage in scholarship that "matters," and as environmental historians produce books and articles that are recognized by the broader scholarly community as significant contributions to our ways of understanding of the past. The methods and insights of environmental historians also hold promise for our practice as industrial archeologists. Indeed, there are ways in which our own practice could contribute to the work of environmental historians as well, but this article will focus on what we as industrial archeologists can learn from them.

A first task is to define environmental history. A number of scholars in that field have written essays describing it, or what they think the definition ought to be.[1] Their descriptions share a common characteristic: environmental history looks at the dynamic and reciprocal interactions among three sets of realities, or three poles, but the historians differ in how they define those three poles. I'll use a definition of the field provided by Arthur McEvoy in an essay he published in *Technology and Culture.* Writing for historians of technology and industrialization, he states:

> As a method ... environmental history looks to the ways in which ecology, political economy, and human consciousness interact with each other over time, each continually adapting to a dynamic environment made up of the other two.[2]

Like other environmental historians, McEvoy stresses that what is often uncritically called the "natural environment" is more than a static and passive stage on which human history takes place. According to McEvoy

> Environmental history portrays nonhuman nature as an active player in human history. Its fundamental insight is that nothing that people do is without causes and consequences in nonhuman nature. The interaction between the two works ecologically, through the medium of biology and adaptation, whether the human protagonists are aware of it or not. Technology is what distinguishes human activity in nature from that of other animals; because technology is a means of interacting with nature, however, it should be amenable to ecological analysis.

Initially, environmental historians usually looked at environments that did not include significant "built" components. Rather, they looked at ways that humans shaped what would otherwise be considered the natural environment. They investigated the history of how humans have made seemingly natural landscapes into artifacts. One of the first topics by which environmental historians' concerns bridged to industrial archeologists' interests involved the control of water resources. Noteworthy examples include Ted Steinberg's *Nature Incorporated,* which looks at the ecological consequences of having incorporated the Merrimac River into the industrial system controlled by the textile industry of Lowell and other New England towns; Don Worster's *Rivers of Empire,* which describes how the nation's dam-building transformed the American West into a hydraulic society; and Richard White's *The Organic Machine,* which explores the changing ways humans have manipulated the Columbia River to yield energy in forms such as food and electricity.[3] More recently, environmental historians have turned their ecological methods to analyses of special interest to industrial archeologists and historians of technology. Two excellent examples are Andrew Hurley's *Environmental Inequalities,* which examines how class and race correlate with the relative proximity to industrial pollution in the residential neighborhoods near the steel mills of Gary, Indiana; and Christopher Sellers' *Hazards of the Job,* which examines the contributions of Alice Hamilton and other early industrial hygienists to the emerging science of environmental health.[4]

That environmental historians are taking increasing interest in industrial topics is evident in the contents of *Environmental History,* the quarterly of the American Society for Environmental History. The journal is publishing ever more articles on the interplay of industry and the environment.[5] Environmental historians are also taking their approach to related subfields of history. For example, Christine Rosen and Christopher Sellers recently guest-edited a special issue of *Business History Review* called "Business and the Environment." The issue features an introductory essay by the editors and four articles on topics that should be of interest to industrial archeologists.[6] Some historians of technology are also growing more interested in the relationship of their field to environmental history. Intersections are described in a fine recent historiographic essay by Jeffrey Stine and Joel Tarr in *Technology and Culture.*[7]

The Absence of Ecological Analysis in Industrial Archeology

The above examples should make clear the potential links between environmental history and the industrial artifacts that are our focus. Our understandings of which artifacts merit our attention have expanded over the years. From an early interest in single objects, whether machines or structural monuments, our gaze has broadened to encompass landscapes. We now devote considerable attention to recording, analyzing, and interpreting whole landscapes comprised of complexes of industrial buildings, the linear systems that link buildings within those complexes to each other and connect them to sources of supply, the neighborhoods that grew around industrial complexes to house workers, and the topographical features on the land, such as mine cuts or waste dumps, that have been caused by industrial activity. As we have expanded the scope of our activity in the field, we have been able to expand the kinds of information we can contribute. We can now not only illuminate how machines worked or were made but also how workers interacted with each other or their bosses, for example, based on the patterns of buildings people developed to carry out those interactions.

An important absence, however, in what we record, analyze, and interpret is often the nonhuman environment. This stems, perhaps, from a mechanistic bias we carry that grows out of our affinities for engineering and industry. We are so interested in how human-made things work that we have paid little attention to how they interact with the nonhuman environment. The extent of information we derive from our labors is therefore truncated. To illustrate this point, I will dissect the extensive landscape study of Ironbridge Gorge in England, as described by Judith Alfrey and Catherine Clark in their 1993 book, *The Landscape of Industry.*[8] I use this example not to be critical but because, to my knowledge, it is the best book in our field (in English) describing an extensive landscape recording project.

Ironbridge embodies both the beginnings of the Industrial Revolution and the beginnings of our field. Between 1985 and 1988, the Ironbridge Institute conducted an extensive archeological survey of roughly 25 square kilometers or about 10 square miles. The team recorded an extensive array of features on the landscape, ranging from buildings to waste dumps, and combined that information with a wide selection of documentary evidence, written as well as cartographic and photographic, to draw insightful conclusions about the history of the development of Ironbridge Gorge as a human habitation. A domain of features they did not record (at least according to the published results), is the biological, setting aside the fact that humans are biological creatures. *The Landscape of Industry* devotes considerable attention to the mineral resources in the environment that drew people to the area and helped foster industrial development, but little is said about the biological environment. Readers learn that some areas were wooded and some open and that steep sidehills made much of the area unsuitable for agricultural settlement. Although there was some sparse agricultural settlement prior to the industrial period, the people responsible for the industrial development moved to the area to exploit the mineral resources. They were not struggling agriculturalists who turned to industrialization as an alternative that might enhance their livelihoods, as was the case in many other early scenes of industrialization.

In the account offered in *The Landscape of Industry,* we read fleeting references to woods and meadows and to agriculture being conducted to supply the market of settlers working in industry. We learn nothing, however, of the plant species that thrived in the gorge before industrialization, of the plant and animal species that lent themselves to agriculture in the area, of the ways industrialization thwarted either the natural or the agricultural ecology of the gorge, or of the ways industrialists responded to the biological feedback they received from their environment, human and nonhuman alike. I find no mention of either air or water pollution in Ironbridge Gorge, but I am certain that both would have been issues during the history of the place. These are the kinds of questions an appreciation for environmental history could stimulate us to ask as we record physical data from the landscape and search the historical record for data about the historical landscape.

There are, certainly, historic industrial landscapes in which archeologists have attended to the kinds of questions environmental historians might pose. One category is the iron plantations that were scattered across Pennsylvania and elsewhere early in U.S. history. The National Park Service

(NPS), for example, interprets the biological as well as the geological features of the environment surrounding Hopewell Furnace (see figure 1). Although the dwellings and other buildings clustered around the blast furnace form the core of what the NPS interprets at Hopewell, visitors learn not only how the furnace worked to smelt iron but also how the owner and his employees gathered iron ore and limestone from the mineral environment and how they managed the woodlands to supply enough charcoal to fuel the smelting operation. Visitors also learn how the plantation functioned agriculturally to supply the food needs of the people and livestock who lived and worked there. Hopewell Furnace embraces the kinds of questions an environmental historian might ask of an industrial site for at least two reasons. First, the iron plantation, by its very organizational structure, was intended to be a self-sufficient industrial system that supplied its own biological and mineral resources. Second, the NPS, having a genealogy rooted in the preservation and interpretation of natural resources, is inclined from its creation to employ ecological interpretations whenever possible.

When we are engaged in the practice of industrial archeology, our challenge from environmental historians is to employ questions informed by an ecological understanding of the way things, including industrial things, work in the natural world. One of the things environmental historians often consider is the full range of outputs of a human undertaking, including byproducts or wastes. Many industrial operations, especially those predating our late-20th-century attention to the damaging impact of industrial pollution on the environment, expected their surroundings to serve as a sink, to somehow absorb or otherwise deal with the products of production that had no marketable value.[9] In other cases, early industries conveyed their byproducts as far from the plant as necessary to alleviate any nuisance at the worksite, hoping that no one else would be bothered by the byproducts either. Because products, not byproducts, were the main objects of industrial enterprise, business owners, managers, and employees often did not spend a lot of time thinking about byproducts and how they were discarded or managed. And because we usually identify historic industries by their products, not their byproducts, we have often been most interested in recording the physical aspects of an industry that were part of the process leading to finished products.

We've been interested, for example, in the receiving dock, where raw materials arrived; in the parts of the plant where materials were processed; in the housing, where workers lived; and in the shipping dock, where finished products were sent to market; but we may have paid little attention to the back door where wastes were thrown out. If we've recorded the back door as an exit point for byproducts, how far have we looked beyond it to see where those wastes have fallen? Who has had to bear the brunt of those wastes falling where they have? Did the industry in question manage the wastes in any way after they were discharged? How have the waste deposits changed over time?

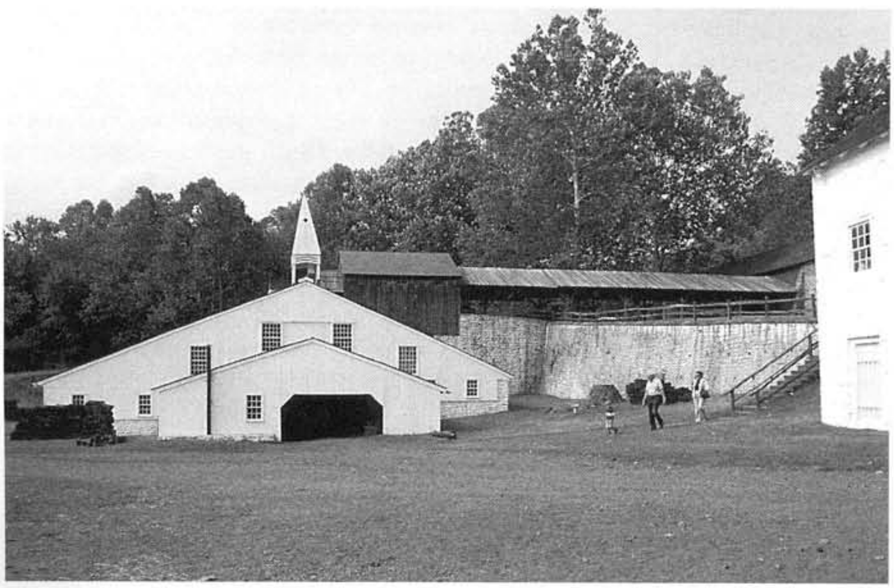

Figure 1. *Although the blast furnace is a central feature at Hopewell furnace, an iron plantation in Pennsylvania, the National Park Service interprets more than just the metallurgical features at the site. The NPS also interprets the lives of workers and families who lived there and the ways those people managed resources on the plantation to insure a long-term supply of charcoal for the furnace, fodder for their livestock, and food for themselves.* Photo by author.

The Geography of Industry and Imagination in Environmental History

It is not uncommon for historians to show how the context of broad and distant social, political, and economic attitudes and events helped shape local attitudes and events. Environmental historians like to demonstrate how the local and the distant are also linked physically. An excellent example of such a work is William Cronon's *Nature's Metropolis: Chicago and the Great West,* in which he demonstrated how one cannot fully understand the history of Chicago without understanding the ecological history of the Western frontier that was opening during Chicago's rise, and one cannot fully understand the history of those hinterlands without understanding what was happening in Chicago during the period of frontier development.[10] Cronon's approach to history, showing the geographical links between urban-industrial areas and hinterlands, can inform our own analysis of industrial sites by compelling us to ask what processes necessary to a site in question actually occurred in remote locations. If such remote processes can be identified, what artifacts of linkage can we identify? And what can the remote processes and their linkages tell us about spatial and social hierarchies that once existed.[11]

There is another significant characteristic of much of the work of environmental historians. Even if the main focus of a particular work is on a specific group of people and how they have interacted with nature, the environmental historian will usually take pains to describe how other groups have interacted with nature at that same place, possibly in earlier times. This serves a number of purposes. First, it shows that the ways a particular group used nature in a particular place are by no means the only ways to work with nature in that place. It also helps to highlight the values various groups find in or ascribe to their environment. A particularly eloquent example of this technique is Elliott West's *The Contested Plains: Indians, Goldseekers, and the Rush to Colorado.*[12] An insight he has added to the inquiry is imagination: when the members of a particular group gaze across an environment, such as the Central Plains in his case, what do they imagine they are seeing?

The Central Plains served a pivotal function among several groups. It was the geographical nexus between the Indians of the Upper Mississippi Valley and the Indians of the Southwest, and a migration barrier between Euro-Americans of the American Southeast and the goldfields of Colorado. Depending on who was doing the looking, some saw in the Central Plains an area that could sustain them with buffalo and their ponies with forage, or an area that could serve as a controllable trading center, or as an inhospitable area that had to be crossed to get to the riches of the gold fields, or as an area that could sustain crops and herds to supply the mining communities. As competing groups vied for control of the Central Plains, they also worked to turn the area into what they imagined it was. Such stories of struggle or cooperation for control of land and resources are often at the heart of environmental histories. We would do well to be aware of those stories as we engage in our own studies.

For example, returning to the antecedent theme of byproducts discharged out the back door of an industrial plant, we might look beyond the back door to determine whose burden those wastes have become. Was the environment at various times in history able to absorb or otherwise handle those wastes? In other words, was the output of waste by one group in the ecosystem a source of supply for another group, whether human or nonhuman? Were the wastes discharged in such quality and quantity that the second group could make good use of them? Or did the wastes accumulate beyond acceptable levels and become a nuisance? And if the wastes became a nuisance, who had to deal with the nuisance, the actor producing the waste or someone else? If it was someone else, the situation may have led to conflict over land and resources. And resolution of conflict may have led to new physical evidence on the landscape (see figures 2 and 3).

Case Study: Copper in Montana

The landscape of the copper industry in Montana illustrates some of these points. First, some historical background is in order. Butte began as a gold mining camp in the 1860s. Living in a boomtown, Butte's first residents did not know what sort of settlement Butte would become, if indeed it would become a permanent human habitation at all. Casting their eyes on the Butte hill for the first time, settlers saw promise, but exactly what the Butte hill promised depended on what the viewers imagined they saw. Two quotes from the 1860s express very different visions. The first is from Joe Bowers writing to the *Montana Post* in January 1865:

> Butte City is beautifully located on an eminence near the junction of the left and right branches of Silver Bow Creek, and close to a stately grove of pine trees, beneath whose shelter has suddenly come into existence a town, comparatively small as yet, but destined ere long to be one of the most flourishing and prosperous in the territory of Montana.[13]

Bowers looked about and saw an environment that could shelter and sustain life and a human community. Nearly 10 years earlier, Caleb Irvine, the first Euro-American to record his passage through the Summit Valley just below the Butte hill, reported that, when he rode by on horseback,

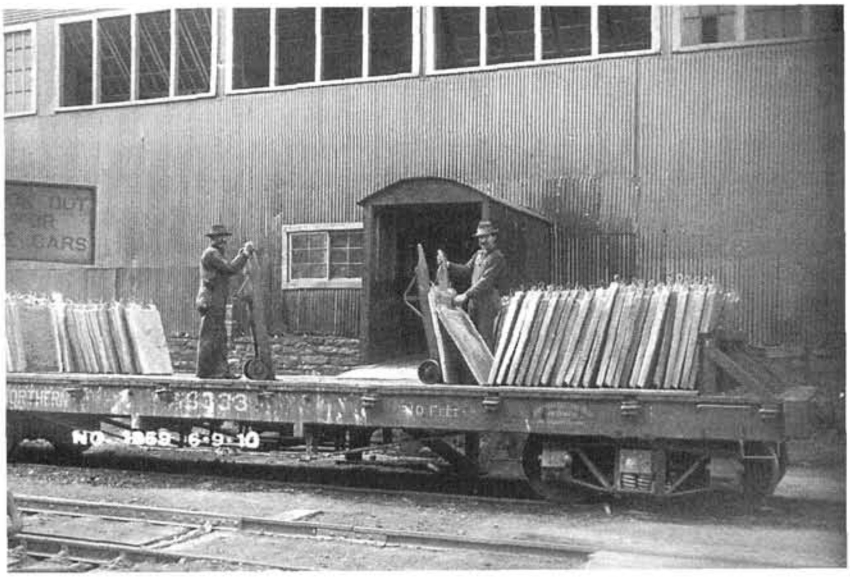

Figure 2. *It may often be more typical for industrial archeologists and other scholars to investigate the loading dock, where raw materials are received and finished products shipped, than to attend to the outlets for wastes from industrial processes. Workers are shown here loading cast copper anodes onto a railroad car at the Anaconda Copper Mining Company's smelter at Great Falls, Montana, in the early 1900s.* Photo courtesy of the Montana Historical Society.

Figure 3. *This photo, presented as evidence in 1905 in* Magone v. Colorado Smelting and Mining Company, et al, *shows an open "culvert" carrying Silver Bow Creek through the tailings impoundments at the Butte Reduction Works at Butte, Montana. Water flowing into the culvert on the left is the overflow from an impoundment where solid tailings have settled after having been discharged from the concentrator at the smelter, visible in the background. Such a technology for managing industrial wastes would not normally have attracted the attention of a photographer, had it not been for the trial.* Photo courtesy of the National Archives, Seattle Branch.

the bunch grass in the valley came up to his horse's knees. He described a Butte hill with scattered tall trees about its upper reaches and a grove of trees in an upper basin that would become the Town Gulch described by Joe Bowers. The first few hearty souls to spend a winter at Butte in 1864–65 chose the protection of that grove of trees. It provided their rude cabins additional shelter, and the south-facing slope of the Butte hill provided ample winter grazing for their stock. Equally important, it was close by their placer diggings.[14]

For it was Butte's mineral resources, the nonliving environment, that thrilled the imaginations of others who saw the place for the first time. Compare Joe Bowers' words to those of another 1865 Butte visitor reporting to the *Montana Post* what appeared in his mind's eye as he cast his gaze upon that same environment:

> The scenery changed rapidly, and we were soon in the heart of that celebrated formation of quartz riven rock. Once upon a time, there must have been some hot work going on, for the country looks as if it had been melted, and set on end to cool.[15]

Where one saw protective trees and lush grass that helped sustain life, another saw rocks that once were melted, and perhaps more important, could be melted again to relinquish their mineral wealth. Such competing visions would have much to do with how the history of Butte and its region unfolded, as these and other groups fought to turn the physical reality they encountered into the landscape of their dreams (see figure 4). Those who saw rocks melting became the dominant group in and around Butte for many decades, as the hill emerged to become the world's largest supplier of copper, a status it held for about 30 years straddling the turn of the 20th century. But the miners' and metallurgists' rise to dominance was not uncontested, and the environmental conflict of the period had much to do with many features we see on the landscape today. Knowing that, we can look with more discerning eyes at some of the features we have ignored in the past.

A prime example of an ignored feature is the Anaconda stack. Actually, the stack itself has not been ignored so much as its reason for being. At 585 feet, it is the tallest masonry structure in the world and the only surviving structure of the Anaconda smelter. When the Anaconda Company closed the smelter in 1980 and announced soon thereafter that the entire complex would be demolished, a citizens group arose to save the stack, seeing it as a monument to the generations of their forebears who had toiled in the works. There was not universal support for the idea, however, because some people saw the stack as a symbol of the toxic fumes that had permeated the smelter environment and shortened the lives of their loved ones. The Save-Our-Stack movement prevailed, and the stack stands today as a State Monument (see figure 5). But it is a monument to much more than the labors of generations of smelterworkers. The Anaconda Company built the stack in 1918 at the culmination of more than a decade of legal battles with farmers in the Deer Lodge Valley and with the U.S. government, which owned national forest lands adjacent to the smelter. When farmers looked at the Deer Lodge Valley, they saw land that could support abundant crops and healthy livestock. When the forest rangers looked at the nearby mountain slopes, they saw a renewable resource that could supply the nation with timber for generations to come. Neither group saw the mountains and valley as a dumping ground for the toxic metallurgical dust and fumes that result from melting rocks. The stack is a monument to the battle of those competing visions.[16]

Another ignored industrial feature sits along a creek in Butte. Silver Bow Creek flows west of Montana Street and through a small canyon of slag left from the Butte Reduction Works, which closed as a smelter in 1910. After Butte's historic preservation movement began in ernest in the 1970s, and until recently, no one knew why the Butte Reduction Works had placed its slag along the creek like that, obviously going to extra effort to build vertical walls so that the creek could pass between them (see figure 6). Folks in the community were more familiar with the giant slag dump at Anaconda. If slag was simply a worthless byproduct of smelting, why hadn't the Butte Reduction

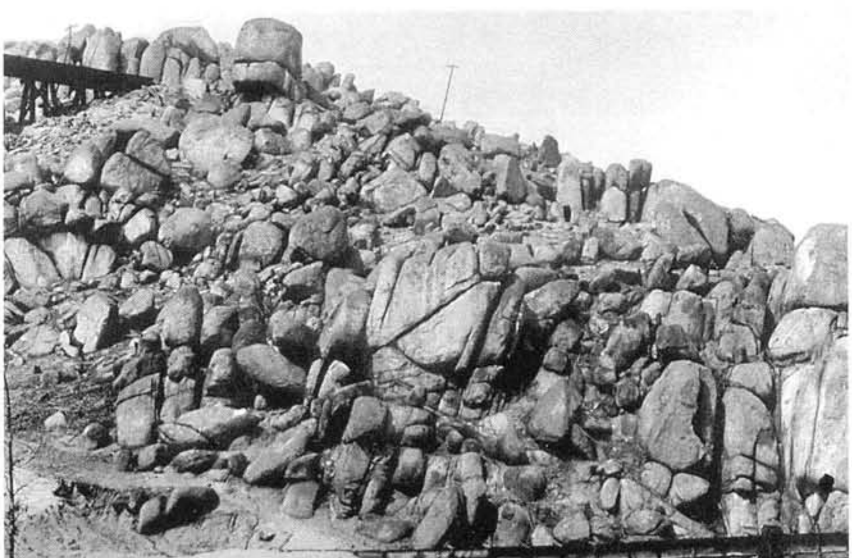

Figure 4. *When prospectors arrived on the Butte hill and saw the abundant rock outcroppings, many exhibiting the vein structure of the Butte ore body, their imaginations were fired with visions of great mineral wealth, not of sustenance derived from the area's organic resources. Butte's industrial hstory may be interpreted as the outcome of those prospectors working to transform their imagined visions of the Butte environment into reality.* Walter Harvey Weed, "Geology and Ore Deposits of the Butte District, Montana," *U.S. Geological Survey Professional Paper No. 74* (1902), plate V.

Works dumped its slag at some distance from the creek, thereby obviating the need to erect such formidable walls? Answers to this question came to light when historians began to explore the metallurgical landscapes of Butte and Anaconda as, among other things, a battleground between those intent on engaging the environment mainly on the mineral level and those who sought to gain biological sustenance from the environment. As it turns out, the Butte Reduction Works recognized its slag as a potentially valuable building material that could serve as a solution to a problem stemming from tailings, the other major type of solid waste discharged by the plant.[17]

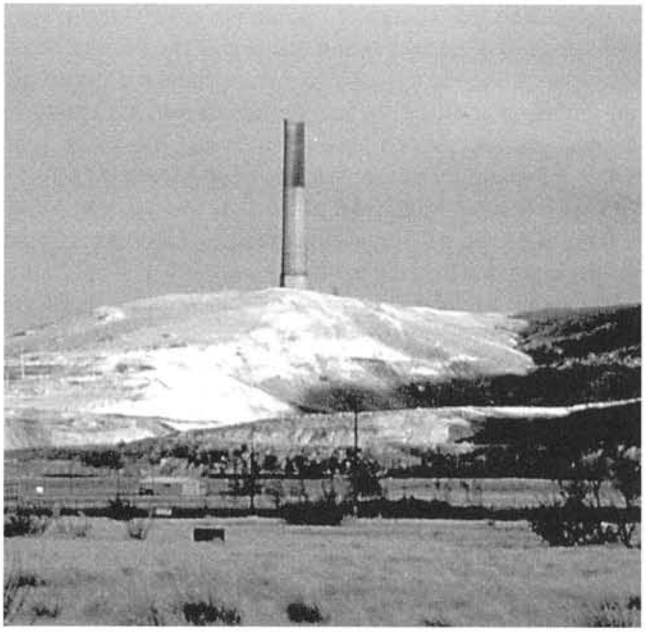

Figure 5. *The 585-foot-tall stack at Anaconda is the only structure surviving at the Washoe smelter of the Anaconda Copper Mining Company. The tallest freestanding masonry structure in the world, the stack has been preserved as a State Monument to the generations of workers who labored at the Anaconda smelters. The stack's history links it much more directly to the environmental history of copper smelting than its labor history.* Photo courtesy of Anaconda Historical Society.

Unlike slag, which is relatively inert and does not erode so readily, tailings can wash downstream. Moreover, tailings readily oxidize, converting insoluble minerals into soluble ones, thereby releasing toxic compounds in solution. As Butte's mills and smelters discharged ever greater quantities of tailings into Silver Bow Creek and onto its banks, those tailings washed downstream, causing both physical and chemical injury to riparian agricultural lands. When downstream property owners grew more vociferous in their complaints, some smelters, like the Butte Reduction Works, tried to engineer means of keeping tailings out of the creek. The slag canyon west of Montana Street is merely the most visible feature of an extensive system of slag structures built by the Butte Reduction Works beginning about 1900 and continuing until the plant's closure in 1910. Other features of the system include slag walls that at one time completely enclosed the perimeter of the large tailings dump, a slag channel that diverted the seasonal flow of Missoula

Figure 6. *The black slag canyon carrying Silver Bow Creek through the grounds of the Butte Reduction Works is one of the few surviving physical features of that early-20th-century metallurgical facility. Only recently have scholars learned that the slag walls were not merely a novel means of discharging tailings but actually were meant to manage tailings discharged from the plant in the early 1900s.* Photo by author.

Gulch around the tailings dump, and a slag culvert that carried Silver Bow Creek beneath the bed of the tailings. With this system, the Butte Reduction Works could impound all the tailings it produced and allow Silver Bow Creek to flow through the smelter complex without carrying any tailings away. Here is a prominent feature at the gateway to Butte's National Historic Landmark that once was thought to be merely a peculiar way of disposing of slag. Now, with proper interpretation, it can help visitors and residents alike understand the historic conflicts that have arisen between groups of people with incompatible visions of how they want to function in the environment.

About 40 miles downstream of Butte, just beyond the town of Deer Lodge, is the Grant Kohrs Ranch, a National Historic Site that is the principal unit in our system of National Parks for interpreting the historic Western livestock industry. The main house, barn, outbuildings, corrals, and pastures represent an industry that was at the heart of the nation's westward movement. The Clark Fork River flows right through the ranch. The Clark Fork originates several miles upstream at the confluence of Silver Bow Creek, which drains Butte, and Warm Springs Creek, which drains Anaconda. Over the course of more than a century of mining, the mills and smelters of both cities have discharged over 200,000,000 tons of tailings into the headwaters of the upper Clark Fork drainage.[18] Much of the material has washed down the Clark Fork River and through the Grant Kohrs Ranch. Some of those tailings still lie in sterile deposits on the ranch along the banks of the Clark Fork.

One of the costliest components of the Clark Fork Superfund Project in Montana is to clean up the streamside tailings along Silver Bow Creek and the Clark Fork River. The NPS is anxious to have those tailings removed from the grounds of the Grant Kohrs Ranch, believing that the hazardous materials of a Superfund site are incompatible with the qualities that are supposed to be incorporated in a unit of the National Park system. I have argued that the tailings on the Grant Kohrs Ranch should be preserved and interpreted (see figures 7 and 8).

First, we must recognize that the tailings are low-grade hazardous material. Tailings comprise a problem of Superfund proportions in the Upper Clark Fork because of their quantity. In the vicinity of Anaconda, for example, tailings 50–75 feet deep cover about 3,600 acres, or about 6 square miles. Located along one of the major tributaries of the Columbia River, they pose a serious problem. The tailings deposited on the Grant Kohrs Ranch, however, are a drop in the bucket. It is the size of the bucket that makes for the problem, not the toxicity of a drop. Meanwhile, those tailings present the NPS with an opportunity to more fully interpret the history of the Western livestock industry.

As the Grant Kohrs Ranch is currently interpreted, and the NPS is generally doing a marvelous job, we learn how cattlemen struggled with the elements in the harsh environment of the Northern Rockies and within a changing national economy to build an industry that still forms many Americans' pictures of what the West is. But the historical reality is that those same cattlemen had to struggle against another facet of the environment: the mining industry, which had a different vision of how the Clark Fork drainage ought to be used. Their conflict led into court around 1905, when the Deer Lodge Valley farmers, complaining of damage to their property caused by smoke and tailings, filed several suits in federal court against the Anaconda Company.[19] One of those cases, *Fred J. Bliss v. The Washoe Copper Company and the Anaconda Copper Mining Company,* filed in the Montana District of the Ninth Circuit of the U.S. Court of Appeals, was at the time the largest, longest, and costliest suit ever tried in an equity court.[20] More than 200 witnesses testified, including numerous scientists from some of the nation's most prestigious universities. The transcripts of testimony filled 25,000 pages. The farmers were said to have spent $500,000 dollars on the trial and the Anaconda Company

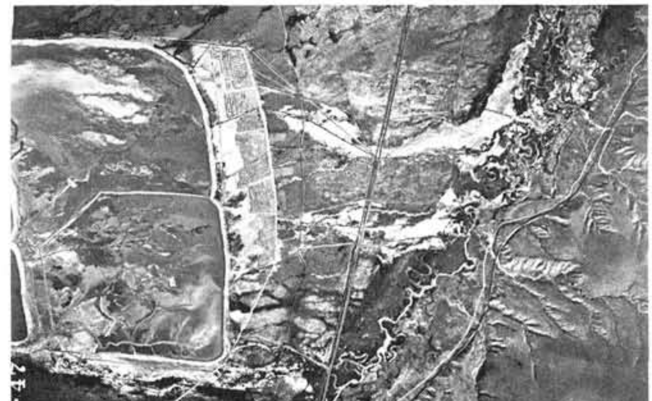

Figure 7. *Many sources of tailings flowed into the Clark Fork River, which ran through the Grant Kohrs Ranch. This 1947 aerial photograph shows Silver Bow Creek, a tributary of the Clark Fork, flowing north from the bottom center toward the upper right. The Grant Kohrs Ranch is several miles downstream (north). The features filling the left third of the photo are a portion of the Anaconda Company's Opportunity ponds tailings impoundment. The light features extending across the photo from the Opportunity ponds toward Silver Bow Creek are deposits of tailings that escaped the impoundments and flowed toward the creek.*

Figure 8. *Tailings washed downstream from Butte and Anaconda are still visible along the Clark Fork River 80 years after the Anaconda Copper Mining Company built the Warm Springs ponds, engineered to prevent tailings from flowing downstream of the ponds. Tailings on the Grant Kohrs Ranch are visible in this photograph as patches of ground without vegetation.* Photo by author.

$3,000,000. The owners of the Grant Kohrs Ranch, Conrad Kohrs and John Bielenberg in partnership, were among the leaders of the Deer Lodge Valley Farmers Association, which raised the money to pay for the suit.[21] The tailings on the Grant Kohrs Ranch could play a major part in helping to dispel the idealized notion that Western ranchers had only to struggle against the natural elements to raise their cattle for market. Those ranchers were also pitted in bitter struggles with other groups in the Deer Lodge Valley and throughout the American West to determine whose vision of the environment would prevail.

Conclusion

The trend we see over the past decade to record and analyze landscapes, including industrial landscapes, is encouraging. But we record and analyze what we see. Therefore, it is important that we expand upon what it is we are seeing. We have made important strides by going beyond seeing individual industrial and engineering structures to see whole human and industrial landscapes. We can take further strides by recognizing the nonhuman and the biological aspects of the industrial landscapes we are recording and analyzing. By doing so, we can contribute additional insights into how industrial people have laid claim to a place in the world.

Notes

1. The two environmental historians who have probably devoted the most attention to trying to define the field in writing are Donald Worster and William Cronon; see, for example, Donald Worster, ed. *The Ends of the Earth: Perspectives on Modern Environmental History* (New York: Cambridge Univ. Press, 1988); Worster, "Transformations of the Earth: Toward an Agroecological Perspective in History," *Journal of American History* 76 (March 1990): 1087–106 (see also in this issue comment essays by Alfred W. Crosby, Richard White, Carolyn Merchant, William Cronon, Stephen J. Pyne, and a response by Worster); William Cronon, "A Place for Stories: Nature, History, and Narrative," *Journal of American History* 78 (March 1992): 1347–76; Cronon, "The Uses of Environmental History," *Environmental History Review* 17 (Fall 1993): 1–22.
2. Arthur McEvoy, "Working Environments: An Ecological Approach to Industrial Health and Safety," *Technology and Culture* 36 (Supplement to the April 1995 issue): S152.
3. Donald Worster, *Rivers of Empire: Water, Aridity & the Growth of the American West* (New York: Pantheon Books, 1985); Theodore Steinberg, *Nature Incorporated: Industrialization and the Waters of New England* (New York: Cambridge Univ. Press, 1991); Richard White, *The Organic Machine: The Remaking of the Columbia River* (New York: Hill & Wang, 1995).
4. Andrew Hurley, *Environmental Inequalities: Class, Race, and Industrial Pollution in Gary, Indiana, 1945–1980* (Chapel Hill: The Univ. of North Carolina Press, 1995); Christopher C. Sellers, *Hazards of the Job: From Industrial Disease to Environmental Health Science* (Chapel Hill: The Univ. of North Carolina Press, 1997).
5. Note that *Environmental History (EH)* represents the 1996 merger of the American Society for Environmental History's earlier journal,

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17. Ibid., C-67–107.
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